

AMENDMENTS TO THE CLAIMS

4. (Currently Amended) A white balance adjusting device for use in a camera in which a field is photographed and a video signal representing said field is formed, said device comprising:

photographic mode setting means for setting a still mode for photographing said field as a still image and a movie mode for photographing said field as a moving image;

color temperature detecting means for detecting a color temperature of said field and outputting a color temperature signal representing said color temperature; and

control means for adjusting a white balance of said video signal in response to color temperature data that is obtained from said color temperature signal, said control means receiving a set output from said photographic mode setting means and adjusting said white balance of said video signal at a shorter cycle as compared with said movie mode when said camera is set in said still mode;

wherein when the still mode is set by the photographic mode setting means, the control means obtains the color temperature signal used for the white balance adjustment so that a first response time length between the detection of the color temperature by the color temperature detecting means

and the white balance adjustment for the image signal of the still image is at most a predetermined time length;

wherein when the movie mode is set by the photographic mode setting means, the control means obtains the color temperature signal from the color temperature detecting means so as to adjust the white balance of the image signal composing the moving image if the color temperature of the field varies while the photographing of the moving image is continuously performed in the movie mode, and the control means obtains the color temperature signal used for the white balance adjustment so that a second response time length between the detection of the color temperature by the color temperature detecting means and the white balance adjustment for the image signal of each of frames composing the moving image is longer than the predetermined time length and is longer than a photographing cycle of the frames composing the moving image.

5. (Original) A white balance adjusting device for use in a camera as set forth in claim 4, wherein said color temperature detecting means comprises:

a color temperature detection element for outputting a first photocurrent signal corresponding to an R component of an incident light from said field and

a second photo current signal corresponding to a B component of said incident light;

a logarithmic conversion circuit for receiving a detection output from said color temperature detection element, compressing said detection output logarithmically and outputting an R signal and a B signal respectively corresponding to said R and B components of said incident light;

a subtraction circuit for calculating a difference between said R and B signals output from said logarithmic ocnversion circuit; and

an amplifier for amplifying a subtraction output signal of said subtraction circuit up to a predetermined level.

6. (Original) A white balance adjusting device for use in a camera as set forth in claim 5, wherein said color temperature detection element comprises a first photo diode for receiving only said R component of said incident light from said field and a second photo diode for receiving only said B component of said incident light, wherein said first and second photo diodes are connected in series to each other in such a manner that the respective cathodes thereof are directly connected to each other for allowing said first and second photo diodes to have mutually opposite polarities.

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7. (Currently Amended) The white balance adjusting device for use in the camera as defined in claim 4, wherein:

the color temperature detecting means sequentially detects color temperatures of the field at a predetermined cycle and sequentially outputs first color temperature signals representing the detected color temperatures;
and

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when the movie mode is set by the photographic mode setting means, the control means sequentially compares each of the first color temperature signals sequentially outputted from the color temperature detecting means with a second color temperature signal currently used for the white balance adjustment, and if color temperature change conditions in which a difference between the each of the first color temperature signals and the second color temperature signal is at least a constant value occur a first number of times, then the control means obtains a latest first color temperature signal and updates the second color temperature signal used for the white balance adjustment by the latest first color temperature signal.

8. (Currently Amended) The white balance adjusting device for use in the camera as defined in claim 7, wherein when the movie mode is set by the photographic mode setting means, the control means sequentially compares

each of the first color temperature signals sequentially outputted from the color temperature detecting means with the second color temperature signal currently used for the white balance adjustment, and if color temperature changing conditions in which symbols of the differences between the first color temperature signals and the second color temperature signal are the same and absolute values of the differences are at least the constant value occur sequentially the first number of times, then the control means obtains the latest first color temperature signal and updates the second color temperature signal used for the white balance adjustment by the latest first color temperature signal.

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9. (Currently Amended) The white balance adjusting device for use in the camera as defined in claim 4, wherein when the still mode is set by the photographic mode setting means, the control means compares a first color temperature signal outputted from the color temperature detecting means with a second color temperature signal currently used for the white balance adjustment, and if a color temperature change condition in which a difference between the first color temperature signal and the second color temperature signal is at least a constant value occurs, then the control means obtains a latest first color temperature signal and updates the second color temperature

signal used for the white balance adjustment by the latest first color temperature signal.

10. (Currently Amended) The white balance adjusting device for use in the camera as defined in claim 7, wherein when the still mode is set by the photographic mode setting means, the control means sequentially compares each of the first color temperature signals sequentially outputted from the color temperature detecting means with the second color temperature signal currently used for the white balance adjustment, and if color temperature change conditions in which a difference between the each of the first color temperature signals and the second color temperature signal is at least a constant value occur a second number of times, the second number being less than the first number, then the control means obtains a latest first color temperature signal and updates the second color temperature signal used for the white balance adjustment by the latest first color temperature signal.

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11. (Currently Amended) The white balance adjusting device for use in the camera as defined in claim 8, wherein when the still mode is set by the photographic mode setting means, the control means sequentially compares each of the first color temperature signals sequentially outputted from the color

temperature detecting means with the second color temperature signal currently used for the white balance adjustment, and if color temperature changing conditions in which symbols of the difference between the first color temperature signal and the second color temperature signal are the same and absolute values of the differences between the first color temperature signal and second color temperature signal are at least the constant value occur sequentially a second number of times, the second number being less than the first number, then the control means obtains the latest first color temperature signal and updates the second color temperature signal used for the white balance adjustment by the latest first color temperature signal.

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12. (Currently Amended) The white balance adjusting device for use in the camera as defined in claim 4, wherein:

the color temperature detecting means sequentially detects color temperatures of the field at a predetermined cycle and sequentially outputs color temperature signals representing the detected color temperatures; and
the white balance adjusting device further comprises a low-pass filter to which the color temperature signals sequentially outputted from the color temperature detecting means are added, the low-pass filter having a time constant larger than the predetermined cycle; and

the control means obtains the color temperature signals via the low-pass filter when the movie mode is set by the mode setting means.

13. (Currently Amended) The white balance adjusting device for use in the camera as defined in claim 12, wherein when the still mode is set by the photographic mode setting means, the control means changes the time constant of the low-pass filter to be smaller.

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14. (Currently Amended) The white balance adjusting device for use in the camera as defined in claim 4, wherein:

the still mode which is set by the photographic mode setting means includes a single mode for photographing the field by a single frame and a sequential mode for sequentially photographing the field at constant intervals; and

when the sequential mode is set by the photographic mode setting means, the control means prohibits updating the color temperature signal that is used for the white balance adjustment at a photographing of a first frame during the sequential photographing after the first frame.

15. (New) A white balance adjusting system for a camera, comprising:
a mode setting device configured to set the camera in one of a still mode
and a movie mode, wherein in the still mode a field is photographed as one or
more still images and wherein in the movie mode, the field is photographed as
as a continuously moving image;

a color temperature detecting device configured to detect a color
temperature of the field; and

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a controlling device operatively connected to the mode setting device and
the color temperature detecting device, wherein the controlling device is
configured to adjust white balance of a video signal in response to the color
temperature detected by the color temperature device,

wherein in the movie mode, the controlling device initially sets and
periodically updates the white balance of the video signal of the continuously
moving image and wherein a length of time between updates is longer than a
photographing cycle of frames composing the moving image.

16. (New) The white balance adjusting system of claim 15, wherein the
still mode includes a single mode and a sequential mode, wherein the field is
photographed in a single frame in the single mode and the field is sequentially
photographed in corresponding frames at constant intervals, and wherein the

controlling device initially sets but prevents further updates to the white balance of the video signal when in sequential mode.

17. (New) The white balance adjusting system of claim 15, wherein in the movie mode, the controlling device is configured to update the white balance of the video signal if a difference between a previous color temperature corresponding to a white balance prior to the update and a current color temperature is greater than a preset value.

18. (New) A method to adjust white balance for a camera, the method comprising:

setting the camera in one of a still mode and a movie mode according to a selection from a user, wherein in the still mode a field is photographed as one or more still images and wherein in the movie mode, the field is photographed as a continuously moving image;

detecting an initial color temperature of the field; and
initially setting a white balance of a video signal in response to the detected initial color temperature; and

periodically updating the white balance of the video signal of the continuously moving image if the camera is in the movie mode, wherein a

length of time between updates is longer than a photographing cycle of frames composing the moving image.

19. (New) The method of claim 18, wherein the still mode includes a single mode and a sequential mode, wherein the field is photographed in a single frame in the single mode and the field is sequentially photographed in corresponding frames at constant intervals, the method further comprising preventing further updates to the white balance of the video signal when the camera is in the sequential mode.

20. (New) The method of claim 18, wherein the periodically updating step comprises:

detecting a current color temperature of the field; and
updating the white balance of the video signal if a difference between a previous color temperature corresponding to the white balance prior to the update and the current color temperature is greater than a preset value.

21. (New) The method of claim 18, wherein the periodically updating step comprises:

sequentially detecting color temperatures of the field at predetermined cycles; and

updating the white balance of the video signal if:

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a direction of the a color change is same for a predetermined consecutive cycles, and

an amount of color temperature change between each of the consecutive cycles is equal to or greater than a predetermined value.